

DOCKET NO.: MSFT-2732
Application No.: 10/782,988
Office Action Dated: 01/25/2008

PATENT
REPLY FILED UNDER EXPEDITED
PROCEDURE PURSUANT TO
37 CFR § 1.116

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently amended) A method for reading a changed data page, said method comprising:
 - ~~changing a data page;~~
 - generating the changed data page in response to a change to the data page as a result of a transaction;
 - storing data associated with the change in a transaction log buffer;
 - marking the changed data page to indicate that the transaction log buffer has yet to be flushed to a persistent data store;
 - determining whether the changed data page is marked; and
 - isolating the transaction by flushing the transaction log buffer to the persistent data store prior to the changed data page being read by a read operation separate from generating the changed data page.
2. (Previously presented) The method of claim 1 further comprising:
 - unmarking the changed data page when the transaction log buffer is flushed.
3. (Previously presented) The method of claim 2 wherein flushing the transaction log buffer occurs when the changed data page is marked, and wherein said method further comprises reading an unmarked data page as part of a read operation that uses data that has been stored in the persistent data store, without first flushing said transaction log buffer.
4. (Previously presented) The method of claim 1 wherein marking the changed data page comprises writing a value of a bit associated with said changed data page.
5. (Previously presented) The method of claim 4 wherein the bit is stored in said changed data page.
6. (Original) The method of claim 4 wherein the bit is stored in a reference table.

7. (Previously presented) The method of claim 1 wherein marking the changed data page comprises recording, in a reference location associated with said changed data page, a copy of a log sequence number from said transaction log buffer and corresponding to the change to the data page.
8. (Previously presented) The method of claim 7 wherein said copy of the log sequence number is stored in said changed data page.
9. (Previously presented) The method of claim 7 wherein said copy of the log sequence number is stored in a reference table.
10. (Previously presented) The method of claim 7 wherein the copy of the log sequence number is used to identify a transaction in order to cause said transaction to effect the flushing of the transaction log buffer.
11. (Currently amended) A computer-readable medium having computer-readable instructions for reading a changed data page, said computer-readable instructions comprising instructions for:
 - ~~changing a data page;~~
 - generating the changed data page in response to a change to the data page as a result of a transaction;
 - storing data associated with the change in a transaction log buffer;
 - marking the changed data page to indicate that the transaction log buffer has yet to be flushed to a persistent data store;
 - determining whether the changed data page is marked; and
 - isolating the transaction by flushing the transaction log buffer to the persistent data store prior to the changed data page being read by a read operation to ensure data consistency in the event of a system interruption.

12. (Previously presented) The computer-readable medium of claim 11 further comprising instructions for:
unmarking the changed data page when said transaction log buffer is flushed.
13. (Previously presented) The computer-readable medium of claim 12 wherein flushing the transaction log buffer occurs when the changed data page is marked, and wherein a read operation that uses data that has been stored in the persistent data store can read an unmarked data page without first flushing said transaction log buffer.
14. (Previously presented) The computer-readable medium of claim 11 wherein the instructions for marking the changed data page further comprises instructions for changing a value of a bit associated with said changed data page.
15. (Previously presented) The computer-readable medium of claim 14 further comprising instructions for the bit to be stored in said changed data page.
16. (Previously presented) The computer-readable medium of claim 14 further comprising instructions for the bit to be stored in a reference table.
17. (Previously presented) The computer-readable medium of claim 11 wherein the instructions for marking the changed data page further comprises instructions for recording a copy of a log sequence number, from said transaction log buffer and corresponding to the change to the data page, in a reference location associated with said changed data page.
18. (Previously presented) The computer-readable medium of claim 17 further comprising instructions for said copy of the log sequence number to be stored in said changed data page.
19. (Previously presented) The computer-readable medium of claim 17 further comprising instructions for said copy of the log sequence number to be stored in a reference table.

20. (Previously presented) The computer-readable medium of claim 17 further comprising instructions for the copy of the log sequence number to be used to identify a transaction in order to cause said transaction to effect the flushing of the transaction log buffer.

21. (Currently amended) A data page reading system, said system comprising:
a plurality of data pages;
a plurality of transaction logs associated with at least one transaction and each of said plurality of data pages;
a first subsystem that changes one of the plurality of data pages, generates a changed data page in response to the change, and marks the changed data page to indicate that the associated transaction log has yet to be flushed to a persistent data store, wherein data associated with the change is stored in the associated transaction log;
a second subsystem that determines whether the changed data page is marked; and
a third subsystem that isolates the at least one transaction by flushing ~~flushes~~ the associated transaction log to the persistent data store prior to the changed data page being read by a read operation to ensure data consistency in the event of a system interruption.

22. (Canceled)

23. (Previously presented) The system of claim 21 further comprising a fourth subsystem that performs said read operation, wherein the second subsystem checks whether said changed data page has been marked and, (a) if so, the third subsystem flushes the transaction log associated with said changed data page and unmarks said changed data page, and the fourth subsystem reads a set of data from said changed data page, and, (b) if not, the fourth subsystem reads the set of data from said data page without first flushing said transaction log associated with said changed data page.

24. (Previously presented) The system of claim 23 wherein the plurality of data pages each comprise a bit that is changed when said respective data page is modified by a transaction.

25. (Previously presented) The system of claim 24 wherein each bit is stored in said respective data page.
26. (Previously presented) The system of claim 24 wherein each bit is stored in a reference table.
27. (Previously presented) The system of claim 23 further comprising a fifth subsystem which records a copy of a log sequence number, from said transaction log and corresponding to said modification of said data page by a transaction, in a reference location associated with said data page when said changed data page is marked.
28. (Previously presented) The system of claim 27 wherein the fifth subsystem uses the copy of the log sequence number to identify the transaction in order to cause said transaction to effect flushing of said transaction log associated with said changed data page and unmarking said changed data page when said associated transaction log is flushed.